

“Keep it Direct”

Design pedestrian and bicycle paths to be as direct as possible. Avoid restricting crossings or forcing bicyclists or pedestrians to use a detour instead of providing a direct route through an intersection. When comparing the directness of alternative routes, planners, engineers, and other highway designers should consider not only distance, but also time and the physical effort that must be expended by pedestrians and bicyclists.



“Light at Night”

Install lighting at pedestrian and bicycle crossings, weaving and merging areas, and along shared use paths.



Lighting increases safety and security for pedestrians and bicyclists.

“Access for All”

Design facilities so that pedestrians and bicyclists of all abilities, ages and skills can navigate with ease.



Pedestrian facilities must be reconstructed to meet or exceed ADA requirements.

Guiding Principles

“Observe”

“They Will Be There”

“Maintain and Improve”

“Tee It Up”

“One Decision at a Time”

“Slow it Down”

“Shorten Crossings”

“Improve Visibility”

“Clarify the Right-of-Way”

“Keep it Direct”

“Light at Night”

“Access for All”

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Complete Intersections:

A Guide to Reconstructing Intersections and Interchanges for Bicyclists and Pedestrians

California Department of Transportation

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Intersections and interchanges are major points of conflict for road users and are the frequent site of injuries and fatalities. In California, nearly 20 percent of pedestrian fatalities, and nearly a quarter of bicyclist fatalities occur at intersections. Intersections also have a significant impact on the mobility of pedestrians and bicyclists. The speed and ease with which they can move through an intersection is affected by the signal timing scheme, the number and configuration of lanes, width of the traveled way, presence of a median or refuge islands, traffic calming configurations, roadsides, landscaping features, traffic volumes, and other factors.

Many of the issues affecting pedestrians and bicyclists can occur at any type of intersection. The guiding principles listed below are meant to summarize some of these common considerations. These principles should be used to guide the development of pedestrian and bicycle accommodations in the project scoping, planning and design phases.

Guiding Principles

“Observe”

Watch how the intersection is being used. How are bicyclists, pedestrians, transit users, and motorists currently navigating the intersection? Where are they crossing? People will not detour very far to cross a high-way. Will people actually use the proposed design change? Rather than restrict desired movements, intersection designs should encourage legal movements, per the California Vehicle Code.



“They Will Be There”

Expect pedestrians and bicyclists to travel anywhere it is legal. Whether or not you meet the transportation needs of pedestrians and bicyclists, they will use a facility, regardless of perceived safety concerns. It is better to meet basic pedestrian and bicyclist mobility and safety needs rather than assuming they will not use the facility.



“Maintain and Improve”

When improving an intersection, do not remove existing nonmotorized facilities, or reduce safety or mobility for pedestrians or bicyclists. Instead, improve existing facilities for pedestrian and bicyclists. Consult the local pedestrian and bicycle coordinator and local and regional pedestrian, bicycle or transit plans to identify additional improvements the community would like incorporated into the intersection project.



“Tee It Up”

Bring intersections to a 90-degree angle; this forces motorists to make slower turns at intersections.



The high-speed ramp has been replaced with a 90-degree intersection.

“One Decision at a Time”

Design intersections so motorists, pedestrians and bicyclists only need to make one decision at a time.



Median refuges allow pedestrians to consider one direction of traffic at a time.

“Slow it Down”

Where appropriate, use treatments that reduce the speed of motorized vehicles at intersections while maintaining operational efficiency, since there is a documented relationship between vehicle speeds and pedestrian and bicyclist crash severity.



“Shorten Crossings”

Reducing crossing distance reduces the time it takes for pedestrians and bicyclists to cross and results in less exposure to crashes. However, avoid increasing safety for one mode while decreasing it for another. For example, while curb extensions help pedestrians, if they extend past parked vehicles they can reduce the useable width of the shoulder, bike lane or shared lane, increasing the risk that bicyclists may strike the curb extension.



“Improve Visibility”

Always ensure maximum visibility of pedestrians and bicyclists through providing ample sight distance at crosswalks, lighting weaving, merging and crossing areas, and installing appropriate pedestrian and bicyclist markings, signage, and signals.



“Clarify the Right-of-Way”

Use design treatments to clarify to pedestrians, bicyclists and motorists who has the right-of-way.

Bike lanes striped to the left of a right-turn only lane reduce the risk of a weaving-related collision.

